



ERES ELECTRONIC COURSE RESERVES DOCUMENT

Copyright citation for JOURNAL ARTICLES -- All rights reserved

Must be attached to each chapter or pages on reserve

Article Title:	"STUDENT. CENTERED CLASSROOM ASSESSMENT"		
Author:	STIGGINS, R		
Publication title:	Thinking Skills: Measuring More than Recall		
Volume:	CAPTRENDS: ASSESSMENT SUPPLEMENT FOR TEACHER		
Year/Date:	2001 / 1985		
Number of pages:			
Professor's Name:	JACQUELINE O'MALLEY - SATZ		
Course Title and Number:	INTRO TO CURRIC AND ASSESSMENT #36453-01		

PLEASE DO NOT USE PENCIL

Defining Classroom Achievement Targets

CHAPTER FOCUS

This chapter answers the following guiding question:

What kinds of achievement must teachers assess in the classroom?

From your study of this chapter, you will understand the following enduring principles:

1. If our goals are accurate assessment and academic success for students, teachers must clearly and completely define the achievement targets that students are to hit.
2. Achievement targets must center on the truly important proficiencies students are to master.
3. Further, we can categorize these achievement expectations in ways that help us understand how to assess them accurately.

Continuing to Define Quality Assessment

In Chapters 1 and 2, we began to uncover the secrets of excellence in classroom assessment. The first secret is to begin development of any assessment with a clear sense of our purpose. We must know why we are conducting the assessment—exactly who will be the assessment user(s) and how they will use it. Different users need different information in different forms at different times to do their jobs. No single assessment can meet everyone's needs. Sometimes the users are students

themselves trying to decide if the learning is worth the risk of attaining it. Sometimes the users are teachers trying to diagnose student needs. Other times they are principals, parents, school board members, and so on. Each brings different information needs to the assessment context.

In this chapter, we move on to the second secret to excellence in classroom assessment: clear targets (Figure 3.1). We must clearly define what we are assessing. What do we expect our students to achieve? Teachers who cannot define the student characteristic(s) that they wish to assess will have great difficulty developing assessment exercises and evaluation criteria that reflect their expectations.

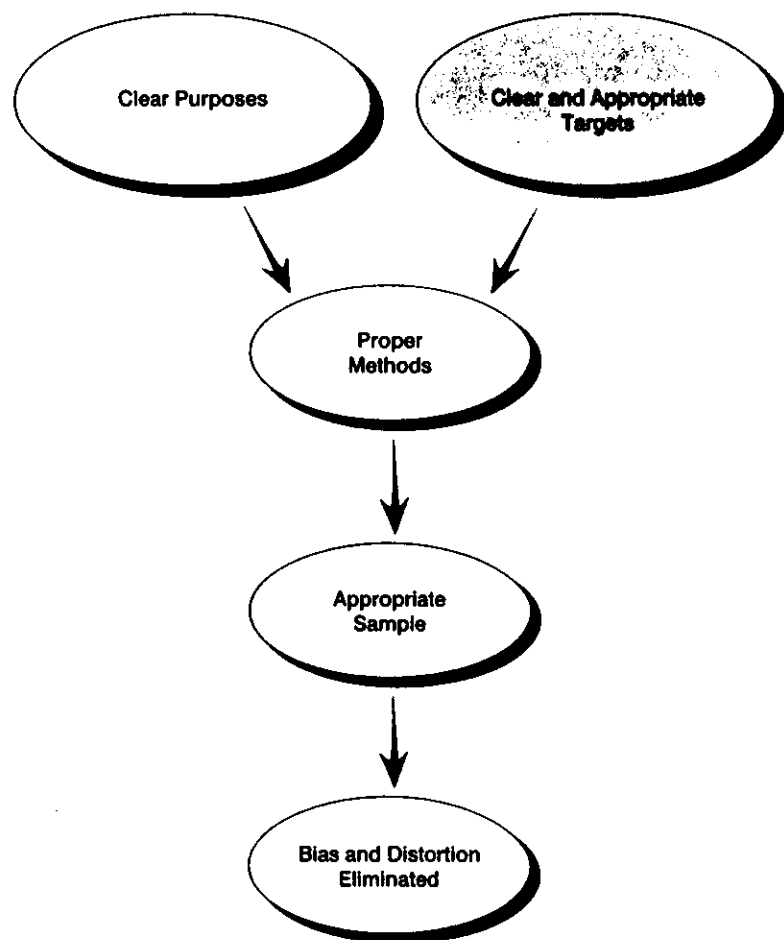


Figure 3.1
Standard of sound assessment 2: Clear targets

Further, they will find it impossible both to share a clear vision of success with their students in terms that their students understand and to select instructional strategies that promise and deliver student success.

Teachers faced with the responsibility of evaluating students' reading proficiency, for example, but who lack a clear vision of what proficient readers are able to do, will be ineffective. Not only must they recognize a proficient reader when they see or hear one, but they also must be able to diagnose the needs of nonreaders and know how to help them. Regardless of the subject or level of education, only those with sharp visions of valued achievement expectations can effectively and efficiently assess student attainment of those expectations.

For this reason, we devote this entire chapter to defining achievement targets for purposes of assessment. Just as you form a foundation of quality assessment by clarifying your purpose, so too do you shape that foundation by beginning assessment with a refined vision of the meaning of academic success. As you strive to define your achievement targets, both as guideposts for instruction and as bases for your classroom assessments, you can benefit from recent advances made by specialists in virtually all subject matter arenas. Our understanding of achievement success, of what students need to learn to succeed during and after school, is clearer today than at any time previously. The work of reading specialists, for example, permits teachers schooled in that work to produce more and better readers today than ever before. And so it is with writing, and with reasoning and problem solving in math, science, and other disciplines. We will explore those developments and their assessment implications in depth in later chapters.

What Is a "Target"?

A *target* defines academic success, what we want students to know and be able to do. Think of a target with its bull's-eye in the middle. That center circle defines the highest level of performance students can achieve; a very high-quality piece of writing, the most fluent oral reading, the highest possible score on a math problem-solving test. Each outside ring on the target defines a level of performance further from the highest level. As students improve, they need to understand that they are progressing toward the bull's-eye.

Our collective goal is that the largest possible percentage of our students get there. To reach that goal, we must define for ourselves and for them where "there" is. What are the attributes of a good piece of writing, such as Emily's end of year sample from Chapter 1? How does this level of performance differ from the outer rings of the target? Ms. Weatherby knew and gave Emily the insights she needed to understand as well.

We have used a variety of labels over the years to identify achievement expectations. We have called them *goals* and *objectives*. Other times we have referred to *scope* and *sequence*. *Proficiencies* or *academic attainments*, we also sometimes

called them. Recent popular terms are *standards* and *benchmarks*. These terms all refer to the same basic concept, the definition of *academic success*.

Our achievement expectations form a solid foundation for classroom assessment when they meet certain standards of quality. We describe these standards in the following subsections.

Targets Are Clearly Stated

Our achievement expectations must be written in clear language and offered in public for all to see. The language should be clear enough that all concerned with their attainment can understand what they mean. When achievement targets are clearly stated, different teachers who read and paraphrase them interpret them to mean essentially the same thing. Indeed, I believe that the clarity of our academic standards hinges on our ability to translate them into "kid-friendly" language, so those we expect to hit the target can understand precisely what we expect of them.

From a slightly different perspective, one criterion by which we should judge the appropriateness of our achievement expectations is our ability to provide samples of student work that demonstrate different levels of proficiency.

Targets Are Specific

We can define achievement expectations at different levels of specificity. They can begin at a very general level:

The student understands and applies the concepts and procedures of mathematics.

From here we can progress to higher levels of specificity, by subdividing the general statement into its component parts:

The student understands and can apply concepts and procedures from number sense.

The student understands and can apply concepts and procedures of measurement.

From geometry, and so on.

It is common to define state and local achievement "standards" at these levels of specificity. And even these can be further subdivided. For instance, number sense includes number and numeration, computation, and estimation.

Individually, our challenge is to be clear with our students about the focus and level of specificity of the achievement expectations we will hold them accountable for in our classrooms. Then, as teachers, we are responsible for devising properly focused opportunities to learn and classroom assessment exercises with scoring procedures that reflect the agreed level of specificity.

Targets Center on What Is Truly Important

But beyond this, our achievement expectations cannot merely be a matter of local opinion. Rather, they must be steeped in the best thinking of leading experts in the field. We don't get to vote on what it means to be a good writer. Those traits have been clearly defined in our professional literature. Whether students are doing good science or solving math problems effectively are not matters of opinion. As teachers it is our personal and collective responsibility to continue to study that professional literature to stay in touch with current thinking in the fields we teach.

Targets Fit into a Big Picture

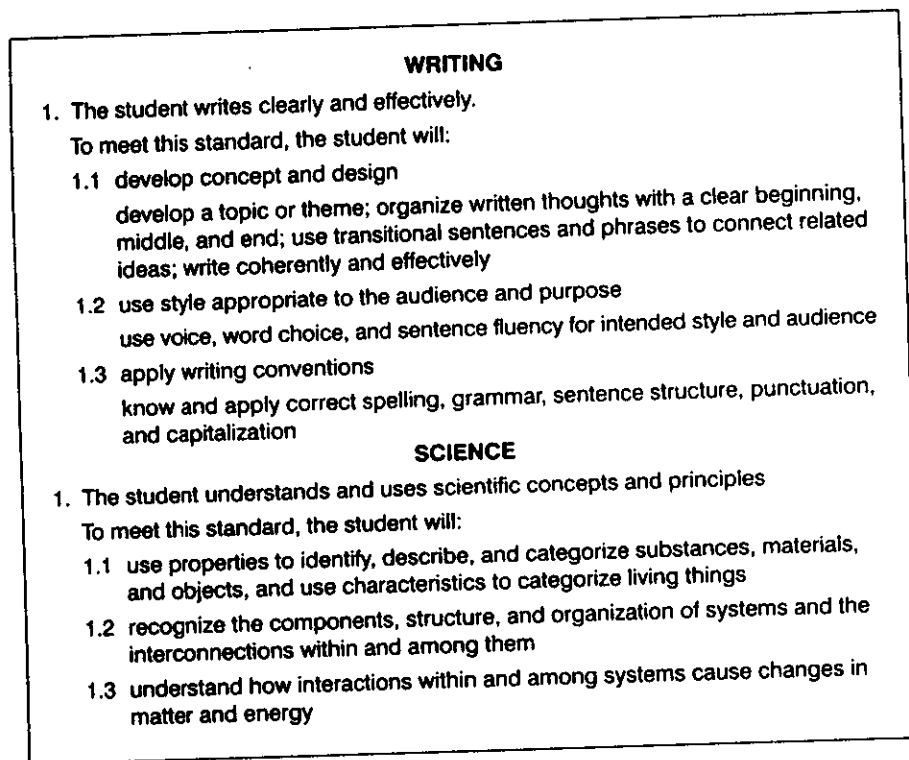
In a similar sense, the achievement expectations held as important in any particular classroom cannot be merely a matter of the judgment of that particular teacher. Rather, they must fit into a continuously progressing curriculum that guides instruction across grade levels in that school and district. The overall curriculum should define ascending levels of competence that spiral through grade levels, mapping a journey to academic excellence. Each teacher's goals and objectives, therefore, must arise directly from what has come before and lead to what will follow.

Targets Fit Comfortably into the Teacher's Repertoire

So, as a classroom teacher, it will fall to you to deliver instruction and to conduct classroom assessments that focus on an assigned set of achievement expectations. To fulfill this responsibility, you must become a confident, competent master of the achievement targets that you expect your students to hit. This doesn't mean, for example, that elementary teachers need to be masters of high school physics. But it does mean they must thoroughly and completely understand those big ideas and concepts in physics that their students must master at this particular point on their journey to high school physics and beyond. I will say much more about this later in the chapter.

An Example

Figure 3.2 presents sample learning requirements for the state of Washington. These represent just a subset of the essential learning objectives that Washington educators feel are important for their students, and are stated at a general statewide level of specificity. But they are *clearly stated* and *specific*. Washington educators have developed benchmarks that define continuous progress in attainment through grades 4, 7, and 10. A sample of these is seen in Figure 3.3. It remains a local responsibility to be sure that each teacher is able to deliver them.

**Figure 3.2**

Sample state of Washington learning requirements

Source: Washington State Office of Superintendent of Public Instruction. Reprinted by permission.

The Benefits of Clear and Appropriate Targets

Any energy you invest in becoming clear about your targets will pay big dividends at assessment time. First of all, it will provide a sharp focus for your assessment exercises and scoring procedures. The result will be high-quality assessments—the remainder of this book details how. But in addition, three other very valuable benefits will result if you can articulate your expectations in appropriate terms.

Limits on Teacher Accountability

One major benefit of defining specific achievement targets is that you set the limits of your own professional responsibility. These limits provide you with a standard by which to gauge your own success as a teacher. In short, defining targets helps you control your own professional destiny.

Source: Washington State Office of Superintendent of Public Instruction.

track is for us to remain clear among ourselves and with others about our means and how to get there.

A Manageable Teacher Workload



Time Saver: In our research on the task demands of classroom assessment, my colleagues and I determined that typical teachers can spend as much as one-third of their available professional time involved in assessment-related activities. That's a lot of time! In fact, in many classrooms it may be too much time. Greater efficiency in assessment is possible.

Clear achievement targets can contribute to that greater efficiency. Here's why: Any assessment is a sample of all the questions we could have asked if the test were infinitely long. But because time is always limited, we can never probe all important dimensions of achievement. So we sample, asking as many questions as we can within the allotted time. A sound assessment asks a representative set of questions, allowing us to infer a student's performance on the entire domain of material from that student's performance on the shorter sample.

If we have set clear limits on our valued target, then we have set a clear sampling frame. This allows us to sample with maximum efficiency and confidence (i.e., to gather just enough information on student achievement without wasting time overtesting). Let me illustrate.

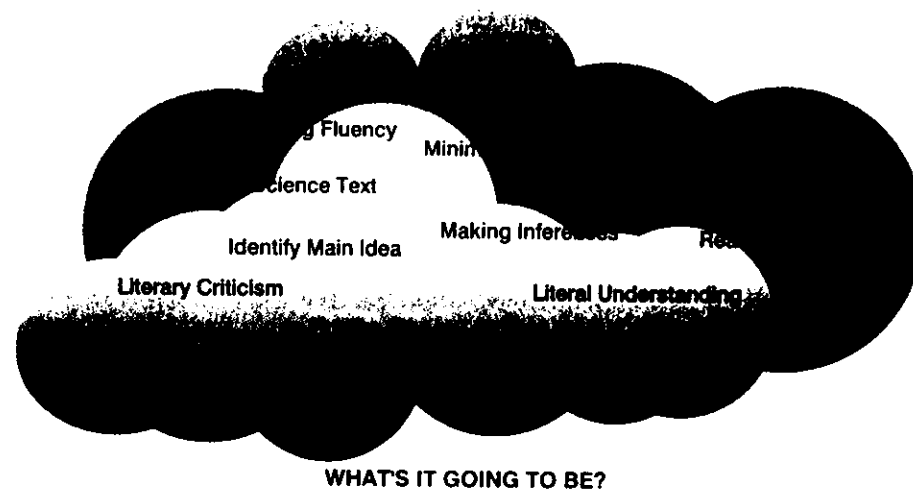
If I want my students to master specific content knowledge, say in history or science, I can devise the most powerful (accurate and efficient) test of that knowledge most easily when I have done the following:

1. Set clearly defined limits on what they are to learn.
2. Established which elements of that knowledge are most important.
3. Sampled those elements with just enough assessment exercises to lead me to a confident conclusion about student learning without wasting time gathering too much evidence.

Similarly, if I select an achievement target in the arena of reasoning and problem solving, I will be confident of student mastery of those proficiencies most quickly (i.e., based on the fewest possible exercises) if I am crystal clear about my definitions of reasoning and problem solving. If my vision of success is vague, I will need more evidence gathered over a longer period of time before I feel certain that my students have hit the target.

For a clear example of the power of focused targets, see Figure 3.4. I can begin my reading instruction with a cloudy sense of what it means to be a proficient

The Unclear Vision



A More Focused Vision

Washington State's Second-Grade Reading Proficiencies:

- Decoding Proficiency
- Oral Reading Fluency and Rate
- Simple Recall of What Is Read

NOW WE'RE ZEROING IN ON WHAT TO ASSESS!

Figure 3.4

Achievement targets defined: What it means to be a good reader

reader, or I can zero in on a clear and specific meaning. Which do you think is most likely to lead to focused classroom assessment?

When I have a clear sense of the desired ends, I can use the assessment methods that are most efficient for the situation. In the next chapter, we will discuss four alternative assessment methods. (In Part II of this book I discuss each of these methods in detail.) I will argue that different methods fit different kinds of targets. It will become clear that some methods produce certain kinds of achievement information more efficiently than do others. Skillful classroom assessors match methods to targets so as to produce maximum information with minimum invested assessment time. This is part of the art of classroom assessment. Your skill as an artist increases with the clarity of your vision of important learning.

There you have several compelling reasons to invest energy up front to become clear about the meaning of success in your classroom. To make it easier for you to define success for yourself and your students, let's set some limits for the range of possible targets.

Types of Achievement Targets

All right, so clearly defined targets are useful. But, you might now ask, how do I make my targets clear? What is it that I must describe about them? The first step in answering these questions is to understand that we ask our students to learn a number of different kinds of things. Our challenge as teachers is to understand which of these is relevant for our particular students at any particular point in their academic development.

As my colleagues and I analyzed the task demands of classroom assessment, we tried to discern categories of targets that seemed to make sense to teachers (Stiggins & Conklin, 1992). We collected, studied, categorized, and tried to understand the various kinds of valued expectations reflected in teachers' classroom activities and assessments. The following categories or types of achievement targets emerged as important:

- *Knowledge*—mastery of substantive subject matter content, where mastery includes both knowing and understanding it
- *Reasoning*—the ability to use that knowledge and understanding to figure things out and to solve problems
- *Performance Skills*—the development of proficiency in doing something where it is the process that is important, such as playing a musical instrument, reading aloud, speaking in a second language, or using psychomotor skills
- *Products*—the ability to create tangible products, such as term papers, science fair models, and art products, that meet certain standards of quality and that present concrete evidence of academic proficiency
- *Dispositions*—the development of certain kinds of feelings, such as attitudes, interests, and motivational intentions

As you will see, these categories are quite useful to our thinking about classroom assessment because they subsume all possible targets, are easy to understand, relate to one another in significant ways, and (now here's the important part!) have clear links to different kinds of assessment. But before we discuss assessment, let's more thoroughly understand these categories of achievement targets.

A Note of Caution

For clarity, I discuss these targets in the order listed. Because the targets build on one another, I can use this order to reveal important aspects of their interrelationships. But there also is danger in my doing this, because imposing order can mislead you with respect to the totality of their relationships. Let me explain.

Because I refer first to knowledge and understanding (sometimes even calling them a "foundation") you may infer that your students must learn content before approaching any other targets. This is incorrect.

Students are natural thinkers, and sometimes they may use this natural thinking process to help them figure things out and come to new understandings. As they become more proficient reasoners and problem solvers under your leadership, they become more capable of independently generating new knowledge and understanding; the two can interact, growing together.

Further, students can experiment with applying new reasoning and performance skills as they learn to create new products. As they refine their reasoning and performance capabilities, their products improve in quality; again, they all grow together. In the process, they figure out how to reason through a problem more effectively, building on their existing knowledge and understanding of how to create quality products.

These relationships among forms of achievement are important. They are dynamically interrelated targets that spiral toward academic excellence together. As a teacher, if I know how I'd like the parts to fit into a dynamic whole, when the need arises I can help my students pull out certain parts (say, gaps in their understanding), examine them closely, and identify where difficulties may reside. For this reason, as a classroom assessor I must be prepared to assess any of the components of academic excellence: knowledge and understanding, reasoning, performance skills, or product development capabilities.

Knowledge and Understanding Targets

When we were growing up, we were asked to learn important content. What happened in 1066? Who signed the Declaration of Independence? Name the Presidents of the United States in order. What does the symbol "Au" refer to on the periodic table of elements? Learn this vocabulary for a quiz on Friday . . . Here is your spelling list for this week . . . Learn the multiplication tables.

We had to memorize these things by test time or fail. And, in fact, at least some of what we learned in this way was important. For example, we would never have developed the ability to communicate our ideas if we had not mastered sufficient

vocabulary. We would not have attained proficiency in speaking a second language if we had not learned the vocabulary and syntax of that language. We would have remained incapable of reading and understanding our science text if we had not learned to understand at least some science content.

If such knowledge is prerequisite to mastery of more sophisticated achievements, then part of our jobs as teachers is to be sure our students gain control of that content. This is precisely why I have structured this book in part to help you know and understand some of the foundations of sound assessment. You cannot do the classroom assessment part of the teaching job well unless you know certain things. In that sense this knowledge represents a foundation of your teaching competence.

But this is not merely about making students memorize content and then regurgitate it for a test. Such work, we now understand, will not lead to academic success. There are several reasons for this.

First, knowing something is not the same as understanding it. To understand content, students need to see how it fits into the larger schema of the academic discipline they are studying. Without such connection, knowledge is useless.

Second, in this information age, the world does not operate merely on facts stored in our brains. I am every bit as much a master of content if I know where to find it as if I know it outright. This way of knowing is becoming increasingly important as technology continues to permeate our society.

And finally, there are ways to come to "know" that do not rely on memorization. I can come to know because I figured it out and the resulting insight left an indelible impression. I can come to know because frequent use of certain knowledge leaves a residue.

In short, mastering (meaning *gaining control over*) content knowledge is a complex enterprise. Let me fill in some details.

To Know and to Understand Are Not the Same. The world around me is full of wonderful things that I know but that I just don't understand. For instance, the Golden Gate Bridge arches beautifully over San Francisco Bay. But I don't understand the structures that keep it from falling into the bay. I know that my computer will save the text that I am composing. But I don't understand how it does this. The French say, "C'est la même chose." I can say this. But I don't understand what it means. Thus, for me these represent useless information.

On the other hand, the world is also full of things that I know and understand. Airplanes whisk me across the country and don't fall out of the sky. I understand that this is because of the vacuum formed under the wing when air accelerates over the top of that wing. I can say and spell the science word *watershed* and I understand what it means. I even understand why it is an important environmental science concept. I can read and understand guidebooks on fly fishing because I know and understand the physics of a fly line in motion.

I submit that merely knowing but not understanding leaves learners unable to make use of what they have learned. Memorizing the multiplication tables without understanding the underlying mathematical concept does not make that knowledge useful. Learning to mimic French phrases cannot lead to effective communication. But knowing and understanding those phrases will.

Therefore, as a classroom teacher/assessor, I must know and understand what I expect my students to master. Further, I must be prepared to assess my students' understanding of what they claim to know.

Two Ways of "Knowing". When I was a student, consequences were dire if anyone was caught with a crib sheet in a test. We were expected to know it outright. We were expected to have burned the content into the neural connections of our brains by whatever means. Remember all the tricks? Flash cards. Repetition—over and over. Cramming. All nighters. Playing recordings while sleeping. If we didn't memorize it, we failed. There can be no question, some of that stuff stuck and that's a good thing. Regardless of how one gets there, knowing something outright can be a powerful way of knowing. But this is not the only way of coming to know.

The reason, as stated previously, is that I am every bit as much a master of content if I know where to find it as if I know it outright. In other words, the world does not operate solely on information retrieved only from memory. To see what I mean, just try to fill out your income tax return, operate a new computer, or use an unfamiliar transit system without referring to the appropriate (hopefully well written!) user's guide. When we confront such challenges in real adult life, we rely on what we know to help us find what we don't know.

In short, this "knowledge" category of achievement targets includes both those targets (core facts, concepts, relationships, and principles) that students must learn outright to function within an academic discipline and those targets they tap as needed through their use of reference resources. Each presents its own unique classroom assessment challenges. And remember, each way of "knowing" must be accompanied by "understanding."

The Structure of Understanding. There is a danger lurking just below the surface of any conversation about student mastery of content in school. We have a habit of thinking of content knowledge as knowledge of facts. What happened in 1066? Who was the tenth president? When was the Louisiana Purchase made? What words did Abraham Lincoln speak at Gettysburg? The danger is that such details will be valued and learned as disconnected facts only. Television game shows often perpetuate this sense of "learnedness."

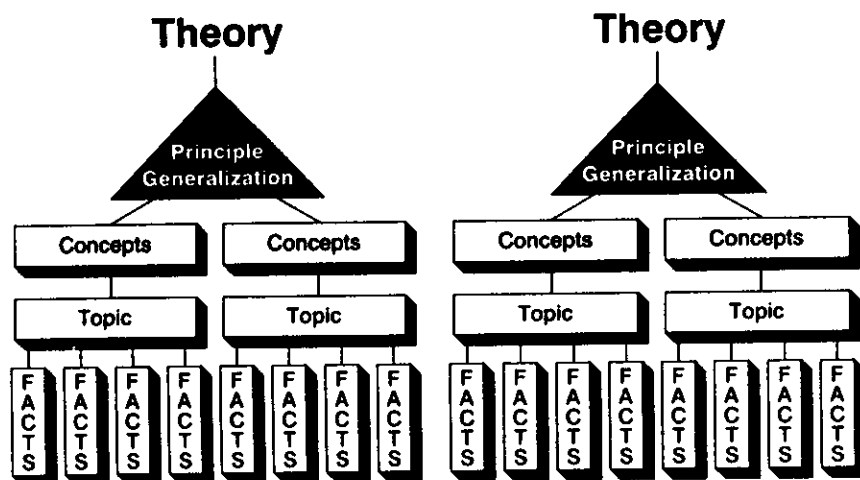
An alternative vision of academic excellence is advanced by those who contend that these facts form into categories that lead us to deeper understanding and that this deeper understanding is what our students should master. Erickson (1998) contends that

Every content-based discipline has a core of conceptual, essential understandings. In this age of knowledge overload, students need a mental schema to pattern or sort information. As they progress through the grades, students build conceptual structures in the brain as they relate new examples to past learnings. This means that teachers, in writing curricula, need to identify conceptual ideas, often stated as essential understandings, that are developmentally appropriate for the age level of their students. Conceptual understandings become more sophisticated from elementary through secondary and post secondary schools. I would not expect to see, in a concept-based (idea-centered curriculum), the same essential understandings at the high school level that I see in the elementary curriculum. (pp. 51-52)

Many who have written of these structures of knowledge and understanding define them in terms of ascending levels of generality. Again, Erickson helps us see the big picture with the graphic depiction in Figure 3.5 and with this example:

<i>Theory:</i>	Migration is a psychologically driven response to meet an internal need.
<i>General Principle:</i>	People migrate to meet a variety of needs. Migration may lead to new opportunities or greater freedom.
<i>Concepts:</i>	Migration Needs Opportunity Freedom
<i>Topic:</i>	Westward migration
<i>Facts:</i>	Lewis and Clark explored the Pacific Northwest. Early American settlers migrated west. Early American settlers looked for new opportunities. (Erickson, 1998, p. 52)

Interpreting and Aligning Standards



Unless our students have this kind of big picture into which to plug the examples they learn, they will have difficulty understanding them. Our teaching and our classroom assessments must venture beyond merely helping students know the facts.

Here's another example that starts at the fact end and works toward enduring (timeless), universal (transferable) and encompassing concepts:

<i>Fact:</i>	Fossils and rocks that are identical appear in vastly different places on the earth's surface.
<i>Topic:</i>	The study of rocks and fossils
<i>Constellation of concepts that transfer:</i>	Continents Layers of the earth's surface The nature of biological and geological evidence
<i>General Principle:</i>	Pieces of the earth's surface have moved.
<i>Theory:</i>	Continental drift

To be clear, facts may well be worth knowing outright, or they may be worthy of the effort needed to retrieve through the use of reference. But that value resides in the understanding that accompanies knowing. Wiggins and McTighe (1999) refer to "enduring understandings" as big ideas that

- Have enduring value beyond the classroom
- Reside at the heart of the academic discipline
- Raise questions and require interrogation, analysis, exemplification to grasp completely
- Offer potential for engaging students—like to be provocative, stimulating (pp. 29–30)

Big ideas yield essential questions that guide exploration of a discipline. They cite Bruner to illustrate:

One of the organizing concepts in biology is the question, What function does it serve?—a question premised on the assumption that everything one finds in an organism serves some function or it probably would not have survived. Other general ideas are related to this question. The student who makes progress in biology learns to ask the question more and more subtly, to relate more and more things to it. (Bruner [1960], cited in Wiggins & McTighe, 1999, p. 28)

Wiggins and McTighe (1999) pose additional essential questions from other contexts: "Must a story have a moral? How does an organism's structure enable it to survive in its environment? What is light? Is U.S. history a history of progress?" (p. 31).

To help our students know and understand content, we ourselves must be masters of the disciplines we expect them to master. Thus, we must be prepared to share the topics, concepts, generalizations, and theories that hold facts together.

Further, as a classroom teacher, part of your job is to devise assessment exercises that require students to demonstrate their understanding of those connections.

Relationship to Other Proficiencies. The foundation of academic competence rests on knowledge and understanding. I know that this is not the trendy position to be taking in the field of education today. We are supposed to be attending to "higher-order thinking" and process skills. I agree that these, too, are important. But there is a danger lurking here.

In our haste to embrace "higher-order thinking," we deemphasize what we have a tradition of calling "lower-order thinking." But what have we traditionally defined as "lower order?" The mastery of content knowledge. So by deemphasizing content mastery, we in effect deny our students access to the very content they need to solve the problems that we want them to solve. Does that make sense to you? Let me illustrate my point.

We cannot, for example, solve math problems (clearly a reasoning competence) without a foundational knowledge of math facts, number systems, and/or problem-solving procedures. Nor can we speak a foreign language skillfully without mastery of its vocabulary, syntax, and structure. It is impossible to write a quality essay in English without a practical knowledge of letters, words, sentences, paragraphs, and grammar, as well as an understanding of how to write in an organized and coherent manner. We cannot read with comprehension if we lack sufficient background about the material presented in the text. We cannot respond to an essay question on the Civil War in history class unless we know something about the Civil War! In every performance domain, there is a basis of knowledge underpinning competence.

Understand, however, that this foundation of knowledge is never sufficient for finding solutions to complex problems. It is merely one essential ingredient. To succeed, we must combine the necessary knowledge with appropriate patterns of reasoning. The essential point is that there is no such thing as content-free thinking. I will amplify this point in the next section.

At any point in instruction, a teacher concerned about student attainment of the building blocks of competence might legitimately hold as the valued target that students master some important basic knowledge. At such a time, assessing student mastery of that knowledge might very well make sense.

Time for Reflection

Identify the academic discipline you regard as your greatest strength. How strong is your underlying knowledge of facts, concepts, and generalizations in that area? Think about your weakest area of academic performance. How strong is your knowledge and understanding base there? How critical is a strong, basic understanding of facts, concepts, and generalizations to academic success?

Reasoning Targets

Having students master content merely for the sake of knowing it and for no other reason is a complete waste of their time and ours. It is virtually always the case that we want students to be able to use their knowledge and understanding to reason, to figure things out, to solve certain kinds of problems. For example, we want them to

- Analyze and solve story problems in math because those problems mimic life after school
- Compare current or past political events or leaders because they need to be active citizens
- Reason inductively and deductively in science to find solutions to everyday problems
- Evaluate opposing positions on social and scientific issues because life constantly requires critical thinking

We want them to use what they know within the problem context to achieve a desired solution.

If we hold such targets as valuable for students, it is incumbent on us to define precisely what we mean by *reasoning and problem-solving proficiency*. Exactly what does it mean to reason "analytically"? It means that we take things apart and see what's inside them. But what does it mean to do it well? That's the key question. What does it mean to reason "comparatively"? We do this when we think about similarities and differences. But when and how is that relevant? Another key question. What does it mean to categorize, synthesize, to reason inductively or deductively? What is critical thinking, anyway? Not only must we be clear about the underlying structure of these patterns of reasoning, but we must help students understand and take possession of them, too. And, of course, we must be ready to translate each pattern into classroom assessment exercises and scoring procedures.

We'll explore these patterns in detail in later chapters. Obviously, they represent important forms of achievement. The key to our success in helping students master them is to understand that any form of reasoning can be done either well or poorly. Our assessment challenge lies in knowing the difference. Our success in helping students learn to monitor the quality of their own reasoning—a critical part of lifelong learning—is to *help them learn the difference*.

In the case of reasoning, as with all achievement targets, we who presume to help students master effective reasoning must first ourselves become confident, competent masters of these patterns. In other words, we must strive to meet standards of intellectual rigor in our own thinking if we are to make this vision come alive in our students' minds. If we do not, then we remain unprepared to devise assessments that reflect sound reasoning.

Relationship to Other Targets. We can use our reasoning powers to generate new knowledge and understanding. When I combine two things that I knew before into an

insight that I hadn't realized before, that insight can remain with me for future use. Further, my reasoning powers can serve as antecedents to skillful performance or product development—the next two kinds of targets. You'll see how as you read on.

Performance Skill Targets

In most classrooms, there are things teachers want their students to be able to do, instances for which the measure of attainment is students' ability to demonstrate that they can perform or behave in a certain way. For example, at the primary-grade level, a teacher might expect to see certain fundamental social interaction behaviors or the earliest oral reading fluency skills. At the elementary level, a teacher might observe student performance in cooperative group activities. In middle school or junior high, manipulation of a science lab apparatus might be important. And at the high school level, public speaking or the ability to converse in a second language might be a valued outcome.

In all of these cases, success lies in "doing it well." The assessment challenge lies in being able to define in clear terms, using words, examples, or both, what it *means* to do it well—to read fluently, work productively as a team member, or carry out the steps in a lab experiment. To assess well, we must provide opportunities for students to show their skills, so we can observe and evaluate while they are performing.

Relationship to Other Targets. Note that two necessary conditions for performing skillfully are first, that students master prerequisite procedural knowledge, and second, that they have the reasoning power to use that knowledge appropriately in performance. For example, I cannot produce a quality written product unless I have handwriting or computer keyboarding skills *and* the language mastery necessary to write fluently and coherently. I cannot produce a quality art or craft product unless I am proficient at using the tools of that medium *and* understand how to mold the raw material into my desired final form. Thus, knowledge and reasoning outcomes form the foundations of skill outcomes. However, it is critical that we understand that, in this category, the student's performance objective is to put all the foundational and reasoning proficiencies together and to be skillful. This is precisely why achievement-related skills often represent complex targets requiring quite sophisticated assessments. Success in creating products—the next kind of target—virtually always hinges on the ability to perform some kinds of skills. Performance skills underpin product development.

Product Development Targets

Yet another way for students to succeed academically is through creating quality products, tangible entities that exist independently of the performer, but that present evidence in their quality that the student has mastered foundational knowledge, requisite reasoning and problem-solving proficiencies, and specific production skills.

For example, a high school social studies teacher might have students prepare a term paper. A technology teacher might ask students to repair a computer. An

elementary school teacher might challenge students to create a model or diorama. A primary-grade teacher might collect samples of student artwork. A classic example of this kind of target that crosses grade levels is the ability to create high-quality written products or writing samples, tangible products that contain within them evidence of the writer's proficiency.

In all cases, success lies in creating products that possess certain key attributes. The assessment challenge is to be able to define clearly and understandably, in writing and/or through example, what those attributes are. We must be able to specify exactly how high- and low-quality products differ.

Relationship to Other Targets. Note once again that successful performance arises out of student mastery of prerequisite knowledge and through the application of appropriate reasoning strategies. In addition, students will probably need to perform certain predefined steps to create the desired product. Prerequisite achievement thus underpins the creation of quality products, but evidence of ultimate success resides in the product itself. Does it meet standards of quality or does it not?

Dispositional Targets

This final category of aspirations for our students is quite broad and complex. It includes those characteristics that go beyond academic achievement into the realms of affective and personal feeling states, such as attitudes, sense of academic self-confidence, or interest in something that motivationally predisposes a person to act or not act.

Many teachers set as goals, for example, that students will develop positive academic self-concepts or positive attitudes toward school subjects predisposing them to strive for excellence. Without question, we want our students to develop strong interests, as well as a strong sense of internal control over their own academic well-being. We may define each disposition in terms of three essential elements:

- It is directed at some specific object.
- It has a positive or negative direction.
- It can vary in level of intensity, from strong to weak.

In other words, attitudes, values, and interests don't exist in a vacuum. Rather, they are focused on certain aspects of our lives. We have attitudes about self, school, subjects, classmates, and teachers. We hold values about politics, work, and learning. We are interested in doing, reading, and discussing certain things. Thus, dispositions are directed toward certain objects, ideas, people, and so on.

Further, our feelings about things are positive, neutral, or negative. Our academic self-concepts are positive or negative. We hold positive or negative attitudes. Our values are for or against things. We are passionate or disinterested. Thus, direction is important. In school, we seek to impart positive dispositions toward learning new things.

Dispositions vary in their intensity. Sometimes we feel very strongly positive or negative about things. Sometimes we feel less strongly. Sometimes the intensity is too weak to ascertain its direction. Intensity varies. Positive learning experiences can result when teachers are in touch with students' dispositions (either as individuals or as a group) and when teachers can put students in touch with their own feelings about important issues. Obviously, however, we cannot know students' feelings about things unless we ask. That requires assessment.

Because these affective and social dimensions are quite complex, thoughtful assessment is essential. We define success in assessing them exactly as we do success in assessing achievement: Sound assessment requires a crystal-clear vision or understanding of the characteristic(s) to be assessed. Only then can we select a proper assessment method, devise a sampling procedure, and control sources of bias and distortion so as to accurately assess direction and intensity of feelings about specified objects.

Summary of Targets

We have discussed four different but interrelated visions of achievement plus the affective component of student learning. Knowledge and understanding are important. Reasoning and problem solving require application of that knowledge. Knowledge and reasoning are required for successful skill performance and/or product development. And dispositions very often result from success or a lack of success in academic performance. But once again, remember that these can all grow and change in dynamic, interrelated ways within students. Table 3.1 presents sample achievement targets from various academic disciplines. Read down each column.

Time for Reflection

Let's say we wanted to extend Table 3.1 to include three more columns. Identify examples of knowledge, reasoning, skill, product, and dispositional targets that would be relevant for Foreign Language (spoken and written, separately) and for Social Studies.

I have seen a problem emerging across the country arising from our collective tendency as educators to be trendy. Back in the 1950s, 1960s, 1970s, and even early 1980s, schools were almost obsessed with student mastery of content and reasoning. Performance skills and product development capabilities were less important.

From the mid 1980s until now, however, our deeper understanding of the complexity of achievement targets has led us to embrace the importance of performance skill and product targets almost to the exclusion of knowledge and reasoning targets. Let me show you when this can be a problem.

A young middle schooler in our neighborhood was being taught by a science teacher who was into "project-based learning." The project-based assignment she gave to her students was to create a complex machine that involved the use of five

-74

Table 3.1
Sample achievement targets across school subjects

Achievement Target	Reading	Writing	Music	Science	Math
Know and Understand	Sight vocabulary Background knowledge required by text	Vocabulary needed to communicate Mechanics of usage Knowledge of topic	Instrument mechanics Musical notation	Science facts and concepts	Number meaning Math facts Numeration systems
Reason	Process the text and comprehend the meaning	Choose words and syntactic elements to convey message Evaluate text quality	Evaluate tonal quality	Hypotheses testing Classifying species	Identify and apply algorithms to solve problems
Performance Skills	Oral reading fluency	Letter formation Keyboarding skills	Instrument fingering Breath control	Manipulate lab apparatus correctly	Use manipulatives while solving problem
Products	Diagram revealing comprehension	Samples of original text	Original composition written in musical notation	Written lab report Science fair model	Diagram depicting problem solution
Dispositions	"I like to read."	"I can write well."	"Music is important to me."	"Science is worth understanding."	"Math is useful in real life."

simple machines. They were to use building skills to create a product to meet certain standards of quality. But nowhere during her instruction did she give students the opportunity to learn what a "simple machine" was. In short, the knowledge and understanding foundations of success were completely overlooked. To be successful, students need all of the pieces in the puzzle.

Step one in planning instruction or designing assessments is to specify the type(s) of target(s) students are to hit. As you will see later, once a target is defined, the process of designing assessments is quite easy. The toughest part by far is coming up with the clear and complete vision!

Sources of Information about Achievement Targets

Teachers can search out, identify, and set limits on the achievement targets that are to represent their particular teaching responsibilities in two ways: through thorough professional preparation and thoughtful planning (teamwork!) with colleagues. Let's explore each.

Professional Preparation

Solid professional preparation to teach provides the foundation for clear and appropriate achievement targets. Put simply, if you intend to teach something, you had better understand it inside and out! Maximum teaching effectiveness arises from having a complete sense of the meaning of quality performance, including a complete understanding of the foundational knowledge and kinds of reasoning and problem-solving skills students need to master to achieve success.

In my years of work in the arena of writing assessment, I have worked with teachers who have been given the responsibility of teaching students to write, but who have only the vaguest notion of what it means to write well. They feel uncertain, and their students struggle. On the other hand, I also have met many teachers who possess a refined vision of success in this performance domain and have seen their students blossom as young writers. These two groups of teachers prepared very differently to meet this professional challenge, and that difference showed in student achievement.

Those who would teach science concepts must first understand those concepts. Those who aspire to being math teachers must first develop a highly refined mental picture of those concepts, and so on. If you would assess in these or any other performance domains you must first become master of the required material yourself. Five ways for you to reach this goal are to (1) be a lifelong learner, (2) participate in available training, (3) understand your state and local academic achievement standards, (4) network with fellow professionals, and (5) remain current with the literature of your field.

Lifelong Learning. Be the same kind of lifelong learner you want your students to become. Take personal responsibility to become good at what you expect your students to be good at. If you seek to help them become good writers, for example, become one yourself. Study, practice, strive to publish your work. Become a proficient performer yourself and commit to your own ongoing improvement, regardless of the target(s) you hold as valuable for your students.

Teacher Training. If you are currently involved in an undergraduate or graduate-level teacher training program, be sure your discipline-based curriculum and instructional methods courses (e.g., in reading, writing, math, science, etc.) reflect the best current thinking about definitions of academic success. Early on in each course, ask specific questions of your professors and evaluate their answers critically.

For example, ask them what vision of student success they believe should govern teaching in this arena. What definition of high achievement do they hold as being most appropriate for students and why? They should be able to provide a written description of the vision they value, and they should be able to cite references from professional literature to support the reasons they hold those particular values. Ask if there is universal agreement among members of the profession that this is the best definition. If not, what alternative visions of excellence in student performance are valued? Why do your professors reject them?

Also inquire about how your professors plan to assess your mastery of those visions of successful student achievement. They should be able to provide specific examples of the assessment exercises and scoring criteria they plan to use.

Evaluate the meaning of student success your professors convey to you. Does it make sense to you? Can you master this vision with sufficient depth to convey it to your students comfortably? I understand that I am asking you to do something that will require a stretch on your part to evaluate their responses to your queries. After all, you're there to learn about achievement targets. However, as a teacher, you must be able to evaluate ideas as you learn them.

I also realize that I am asking you to do something that will require diplomacy on your part, because you do not hold the power in this communication with your professors. But in one sense you do: Their job is to help you become a successful teacher. They have dedicated their professional lives to that effort. If your professors are committed to student well-being, they will welcome your "critical consumer" inquiries. (In fact, among the professors I know personally, you will gain great respect just for asking!)

State and Local Achievement Standards. While the ultimate responsibility for your preparation as a teacher falls to you and you alone, excellent support is available.